WHAT IS CLAIMED IS:

1. A method for inducing an immune reaction to prostatic acid phosphatase (PAP) in a mammal in need thereof, comprising

administering to the mammal an effective amount of a recombinant DNA construct comprising a polynucleotide sequence encoding PAP operatively linked to a transcriptional regulatory element,

whereby the mammal develops immune reaction against PAP.

2. The method of Claim 1, wherein the mammal has prostate cancer.

3. The method of Claim 1, wherein the polynucleotide sequence encodes a human PAP.

4. The method according to Claim 1, wherein the polynucleotide sequence encodes a rodent PAP.

5. The method according to Claim 1, wherein the recombinant DNA construct is administered to the mammal intramuscularly, intravascularly, intravenously, or intraarterially.

6. The method of Claim 1, wherein the mammal is human.

7. The method according to Claim 1, wherein destructive prostatitis is induced in the mammal.

8. The method according to Claim 1 wherein cellular immune reaction against cells expressing PAP is induced.

9. The method according to Claim 8, wherein both humoral and cellular immune reactions against PAP are induced.

10. A method for inducing immune reaction to prostatic acid phosphatase (PAP) in a mammal in need thereof, comprising

administering to the mammal an effective amount of a first recombinant DNA construct comprising a first polynucleotide sequence encoding a first PAP polypeptide operatively linked to a transcriptional regulatory element; and

administering to the mammal an effective amount of a second recombinant DNA construct comprising a second polynucleotide sequence encoding a second PAP polypeptide operatively linked to a transcriptional regulatory element;

wherein the first polynucleotide sequence and the second polynucleotide molecule originate from two different animal species,

whereby an immune reaction against PAP is induced in the mammal.

11. A method according to Claim 10, wherein the first polynucleotide sequence originates from an animal species other than the mammal, and the second polynucleotide sequence originates from the same animal species as the mammal.

12. A method according to Claim 10, wherein the mammal is a human, and the first polynucleotide sequence encoding PAP originates from a rodent.

13. A method according to Claim 10, wherein the second polynucleotide sequence originates from the same animal species as the mammal, and the first polynucleotide sequence encodes a PAP polypeptide that shares at least 85% homology to the first PAP polypeptide.

14. A method according to Claim 13, wherein the first polynucleotide sequence encodes a PAP polypeptide that shares at least 88% homology to the first PAP polypeptide.

15. A method according to Claim 13, wherein the first polynucleotide sequence encodes a PAP polypeptide that shares at least 90% homology to the first PAP polypeptide.

16. A method according to Claim 13, wherein the first polynucleotide sequence encodes a PAP polypeptide that shares at least 95% homology to the first PAP polypeptide.

17. A method according to Claim 13, wherein the first polynucleotide sequence encodes a PAP polypeptide that shares at least 98% homology to the first PAP polypeptide.

18. The method of Claim 13, wherein the mammal has prostate cancer.

19. The method according to Claim 13, wherein the first and the second recombinant DNA constructs are administered to the mammal intravascularly, intraarterially, intravenously, or intramuscularly.

20. The method according to Claim 10, wherein destructive prostatitis is induced in the mammal.

21. The method according to Claim 13, wherein cellular immune reaction against PAP is induced.

22. The method according to Claim 21, wherein both humoral and cellular immune reactions against PAP are induced.

23 A DNA vaccine comprising a plasmid vector comprising a polynucleotide sequence encoding prostatic acid phosphatase operably linked to a transcription regulatory element, wherein upon administration of said vaccine to a mammal a cytotoxic immune reaction against cells expressing PAP is induced.

24. The DNA vaccine according to Claim 23, suitable for intradermal, intravascular, intramuscular or intraarterial administration to a human.

25. The DNA vaccine according to Claim 23, wherein the plasmid vector comprises a backbone of pNGVL3; a polynucleotide sequence encoding PAP operably inserted therein, and an ISS motif.

26. The DNA vaccine according to Claim 23, wherein the plasmid vector comprises:

a polynucleotide sequence encoding PAP operatively linked to a CMV promoter;

a CMV intron A operatively linked to the polynucleotide sequence encoding PAP for enhancing expression of the polynucleotide sequence; and

at least one copy of an immunostimulatory fragment comprising 5'-GTCGTT-3'.

27. The DNA vaccine according to Claim 26, wherein the plasmid vector comprises at least two copies of an immunostimulatory fragment comprising 5'-GTCGTT-3'.

28. The DNA vaccine according to Claim 23, wherein the plasmid vector does not express in eukaryotic cells any gene other than the polynucleotide sequence encoding PAP.

29. The DNA vaccine according to Claim 23, wherein the plasmid vector is pTVG4.

30. A pharmaceutical composition comprising the DNA vaccine of Claim 23, and a pharmaceutically acceptable carrier.

31. A pharmaceutical composition comprising the DNA vaccine of Claim 30, further comprising a suitable amount of GM-CSF.

32. A pharmaceutical composition comprising the DNA vaccine of Claim 23, and a pharmaceutically acceptable carrier.